



GMLN1040



Hands-free Digital Car Kit
User Guide

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User Guide

INTRODUCTION

The Digital Car Kit provides additional operating convenience when using the MTP700 TETRA radio in a vehicular environment. This User Guide provides instructions for using the Digital Car Kit.



WARNING

Before using the Digital Car Kit refer to the Important Safety Instructions at the back of this user guide. In addition read the Product Safety and RF Exposure Booklet supplied with your portable radio.

In addition to providing duplex hands-free communication, the Digital Car Kit provides the following key features:

- Whenever the radio is mounted in the cradle, the radio battery will be charged automatically, within the temperature charging limits.
- Phone and dispatch call types.
- Entertainment mute, if enabled by your service provider, means that the in-car Entertainment System will be muted if a call is placed or received.
- Auxiliary alert, if enabled by your service provider, allows external indication of an incoming private call.

***Note:** The Auxiliary Alert feature must not be activated while driving. If installed properly, the ignition signal will disable this feature while the vehicle motor is running.*

- Data capabilities.

The Digital Car Kit with Digital Signal Processing (DSP), provides enhanced audio quality even when driving at high speeds due to the following features:

- Full duplex operation permits two way audio to occur in Phone mode. For more information refer to radio user manual.
- Noise cancellation filters out ambient vehicle and road noise.
- Echo cancellation minimises echo from your own voice in the system.

This Digital Car Kit is comprised of the following parts:

Radio cradle including battery charger, keys and interface cable (GMLN1038). The Mounting Bracket is part of the cradle.

1. RF Antenna Adapter with Mounting Tool (GMLX1037)
2. Junction Box incl. mounting screws (GMLN1031).
3. Power Cable (GMKN4135).
4. Remote Directional Microphone (GMMN4065).
5. Accessory Mounting Bracket (GMLN1039)
6. Accessory Connector Kit (GMBN1021)
7. Radio side connector Dust Cover (1586499Z01)
8. Installation Manual (6866535D10).
9. User Guide (6866535D09).
10. Passive Remote Speaker 5W (GMSN4078) or 10W (GMSN4066).
11. Remote PTT (RLN4857) or Footswitch with Remote PTT (RLN4856) or Gooseneck with Remote PTT (RLN4858).
12. External antenna (FAE5521, FAE6003 or HAF4002).

Other available accessories are:

13. Handset (GMUN1006)
14. Fist Microphone (GMN4063)
15. TELCO Cable Extension (GMKN4106). This cable extension is required to connect a Handset or a Fist Microphone.
16. Emergency Footswitch (RLN4836)
17. External Alarm Relay (GKN6272)

EUROPEAN UNION DIRECTIVE OF CONFORMANCE STATEMENT

This product is in conformance with the requirements of the applicable Council Directive 95/54/EC.

BATTERY VOLTAGE

The product is suitable for motor vehicles with a 12 volts electrical system having negative earth only. For use in a 24 volts system an approved separate 24V/12V DC/DC converter must be connected between the vehicle battery and the digital car kit. For installation refer to the separate installation instructions of the DC/DC converter. The equipment must be installed according to the recommendations of the Installation Manual and the vehicle manufacturer.

PREPARING THE PORTABLE RADIO FOR USING IN THE VEHICLE ADAPTER

Before the radio can be used in the Vehicle Adapter it must be fitted with an RF Switch adapter to allow for the automatic switching from integral to external antenna. The RF Switch adapter fits between the portable radio antenna socket and the portable radio antenna.

When the radio with the RF Switch adapter fitted is placed into the Vehicle Adapter, the resulting combination operates as a mobile radio.

The following functions occur automatically:

- The radio antenna is electrically disconnected and the vehicle antenna is connected for use.
- The radio internal microphone is electrically disconnected and the Vehicle Adapter mobile microphone is connected for use.
- The Vehicle Adapter charger is connected to the radio battery.
- The Vehicle Adapter will automatically mute the radio internal speaker and route received audio to the external speaker. The audio level of the speaker is set by the radio volume control setting.



WARNING

When using an external speaker, turn the volume control up slowly to the desired audio level to avoid damage from high audio pressures.

FITTING THE RF SWITCH ADAPTER



WARNING

Never rotate the antenna or the black upper plastic part of the adapter to fasten or unfasten the adapter while in the radio's antenna socket. Doing so will damage the adapter or the radio's antenna socket. Always use the mounting tool supplied to rotate the serrated metal wheel while holding the radio with the other hand.

1. Unscrew the radio antenna from the radio.
2. Screw the antenna to the RF Switch Adapter. Hold the black upper plastic part of the adapter with your fingers and rotate the antenna until it sits fixed on the adapter.
3. Position the nose on the downside of the adapter so that it fits into the slot of the radio's antenna socket (see figure 1).
4. Hold the antenna or the black upper part of the adapter with your fingers and turn the serrated metal wheel to screw the adapter into the antenna socket. To fasten the adapter with the delivered mounting tool, hold the radio with one hand, position the nose of the mounting tool into one of the holes on the serrated metal wheel and rotate the serrated metal wheel until it sits firmly on the radio's antenna socket.

Note: With the RF Switch fitted there may be some degradation in radio performance (up to 1.5dB). When the portable radio is operated in the Vehicle Adapter, the vehicle antenna compensates for this degradation and improves the overall radio performance.

Figure 1. Fitting the RF Switch Adapter

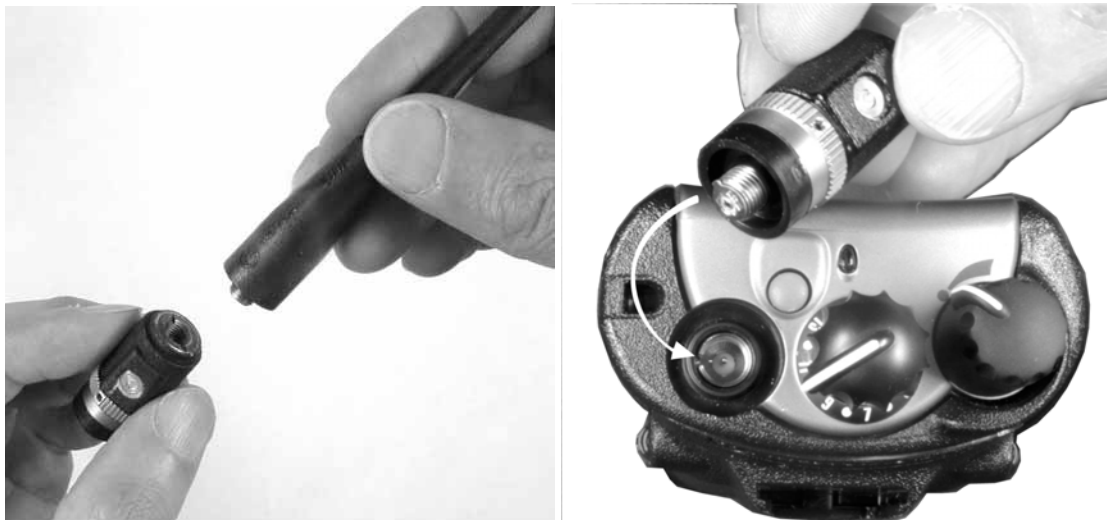


Figure 1. Fitting the RF Switch Adapter



CHANGING THE RADIO'S ACCESSORY CONNECTOR COVER

1. If the radio is fitted with a cover on the accessory connector, remove this cover (refer to the User Guide for your radio). Failure to remove the accessory connector cover may result in permanent damage to the Digital Car Kit.
2. Fit the accessory connector cover, delivered with the Digital Car Kit, on the radio's accessory connector.

ADJUST THE BATTERY CONTACT BLOCK



Placing a radio in the cradle when the battery contact block is not at the appropriate position for the battery size being used may damage the cradle.

Caution

The cradle can hold radios with different battery sizes. To adapt the cradle for the battery size of your radio you may need to adjust the battery contact block inside the cradle.

1. Remove the crosshead screw located at the bottom of the cradle (see figure 2).
2. Lift up the battery contact block and remove it from the cradle.
3. Insert the battery contact block in the appropriate alignment guides (left and right) at the back of the cradle.

Use the front position for battery: PMNN4047

Use the rear position for batteries: PMNN4048, PMNN4049

4. Fasten the battery contact block with the crosshead screw.

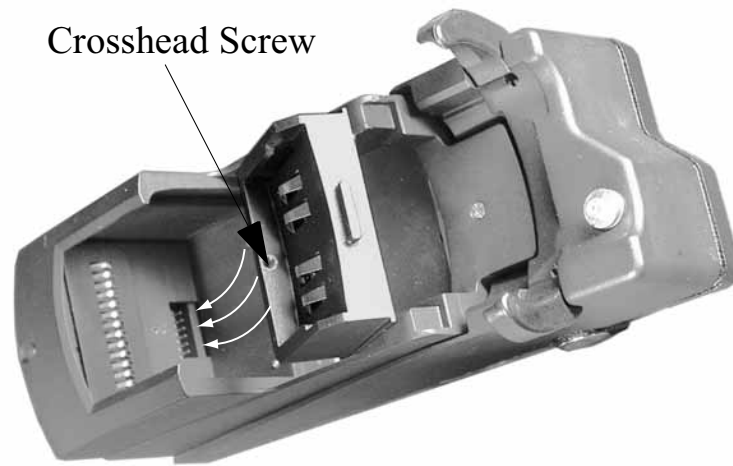


Figure 2. Battery Contact Block

REMOVING THE RF SWITCH ADAPTER OR THE ANTENNA



WARNING

Never rotate the antenna or the black upper plastic part of the adapter to fasten or unfasten the adapter while in the radio's antenna socket. Doing so will damage the adapter or the radio's antenna socket. Always use the mounting tool to rotate the serrated metal wheel while holding the radio with the other hand.

1. Hold the radio with one hand, position the nose of the mounting tool in one of the holes on the serrated metal wheel and rotate the serrated metal wheel to loosen it from the radio's antenna socket.
2. Hold the antenna or the black upper part of the adapter with your fingers and turn the serrated metal wheel to unscrew the adapter completely.
3. To unscrew the antenna from the RF Switch Adapter, hold the black upper plastic part of the adapter with your fingers and rotate the antenna to remove it from the adapter.

PLACING AND REMOVING THE RADIO TO AND FROM THE CRADLE



Figure 3. Digital Car Kit Cradle

PLACING THE RADIO IN THE CRADLE



WARNING

DO NOT fit the battery alone into the cradle as it will not be locked in place and may injure any vehicle occupants in the event of a collision.



Caution

Remove locking key on the right side of the VA cradle before driving, to avoid injury in case of an accident.



Caution

To ensure correct fit of the radio into the cradle, remove non-standard labels from the radio and battery that are not shipped with the standard product. Non-standard labels may be peeled off by the action of installing the radio in the Cradle and may also interfere with proper Digital Car Kit operation or may damage the Digital Car Kit.

***Note:** For optimal operation, always turn the radio OFF before inserting it into the cradle.*



Caution

Make sure that the lock of the Vehicle Adapter is in the open position before inserting or removing the radio, otherwise the radio cannot be pushed back to the correct position. The key should not be in the lock while inserting or removing the radio to prevent permanent damage to the cradle.

1. Slide the radio with the battery attached into the cradle so that the speaker grille faces outward and the controls are accessible.
2. Push the radio backwards until it locks into place.

The LED indicator at the front side of the cradle indicates the battery charge status.



Figure 4. Fitting the Radio



Caution

When using an external speaker, turn the volume control fully counter clockwise to turn the radio OFF, to avoid damage from high audio pressures.

The radio can now be turned ON by slowly turning the volume control knob clockwise until an acceptable volume level is reached. When the radio detects the Vehicle Adapter, a signal is audible and the radio display shows "Car Kit Connected". Once the radio is in the cradle and is turned ON and has detected the Vehicle Adapter, it is automatically in the Hands-free mode and ready for use.

WHEN MOUNTED IN THE VEHICLE ADAPTER THE FOLLOWING OCCURS:

1. The radio antenna is automatically disconnected and connection is made from the radio via the Vehicle Adapter to the external vehicle antenna.
2. The radio's microphone and speaker are automatically disconnected and connection is made to the externally connected microphone and speaker (if hardware is connected and the radio recognized the Vehicle Adapter).
3. The radio battery is automatically connected to the battery charger and charging commences.



C a u t i o n

The Vehicle Adaptor is permanently connected to the vehicle battery. Be careful not to discharge the vehicle battery by leaving the radio inserted or allowing the radio to operate for extended periods of time with the vehicle engine turned off.

Any radio and battery inserted in the Vehicle Adapter is always actively connected to the charging circuit regardless of whether the radio is switched on or off.

REMOVING THE RADIO FROM THE CRADLE



Caution

Make sure that the lock of the Vehicle Adapter is in the open position before removing the radio. The key should not be in the lock while removing the radio to prevent permanent damage to the cradle.



Caution

Do not pull the radio out of the Cradle by pulling on the antenna. This may damage the antenna or cause permanent damage to the radio.

Press down on the cradle release button on the left side of the cradle (See Figure 5) and lift the radio upwards from the cradle.

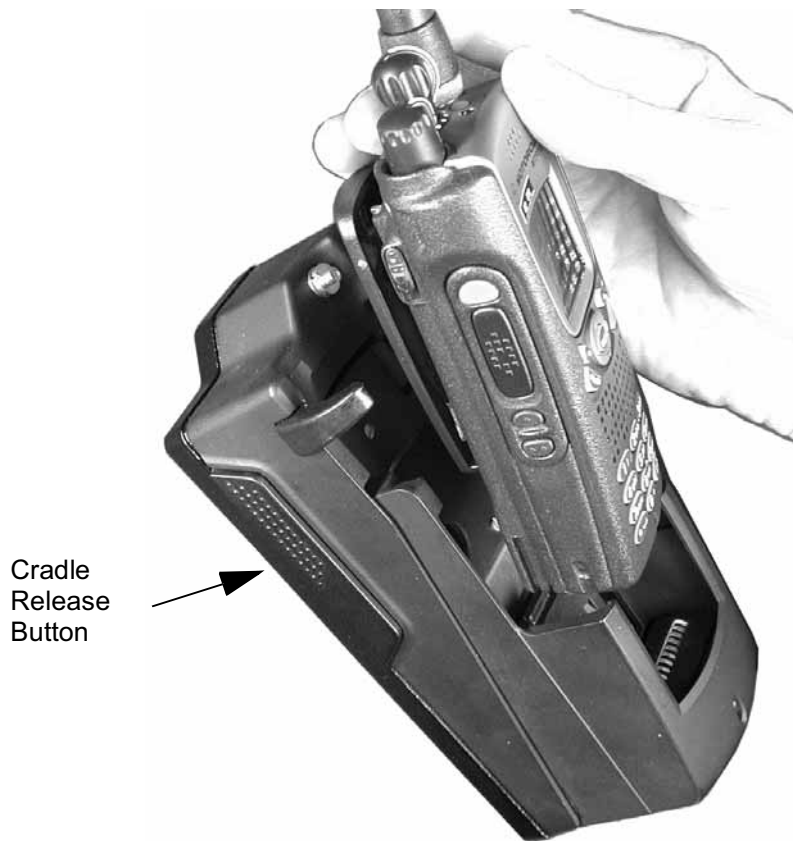


Figure 5. Cradle Release Button

DIGITAL CAR KIT OPERATION

When mounted in the Vehicle Adapter the radio may be operated in the normal way using the external microphone and external PTT switch.

The radio internal audio is automatically disconnected and the received audio routed via the Vehicle Adapter audio amplifier to the external speaker or handset.

The loudspeaker volume is controlled by the radio volume control.

For all other operating procedures for your radio refer to your Radio User Manual.

MAKING A TELEPHONE CALL

1. Set the radio to phone mode (Refer to the Radio User Guide).
2. Enter the desired telephone number or recall it from memory and press and release the remote PTT button or Send key on the radio keypad.
3. When other party answers, speak into the remote directional microphone to transmit audio.
4. Incoming audio will be heard from the remote speaker.

MAKING A DISPATCH CALL - PRIVATE AND GROUP MODES

***Note:** For more details refer to Radio User Guide*

1. Set the radio to Private or Group mode.
2. Dial the required number or recall it from the memory.
3. For group call: Press and hold the remote PTT button.
For private call: Press and release wait for ring back tone.
4. For group call: Wait until you receive a grant tone.
For private call: Audio will be heard, when receiving radio answers call.
5. In case of denial tone, release the PTT and repeat steps 3 and 4.
6. Speak into the remote directional microphone to transmit audio.
7. Incoming audio will be heard from the remote speaker once the PTT button is released.

RECEIVING A CALL

When a private phone call is received, you will hear the ring tones via the remote speaker. To answer the call press and release the remote PTT button or Send key on the radio keypad and speak into the remote directional microphone.

When a dispatch call is received, you will hear the callers voice from the remote speaker. To answer the call, press the remote PTT button and speak into the remote directional microphone.

ENDING A PHONE CALL

To end a phone call, press the End button on the radio keypad.

PERSONAL CALLS

Connecting a Handset to the Vehicle Adapter allows the user to make a call in private. Picking up the Handset from its cradle causes the audio to be routed from the remote speaker and remote directional microphone to the speaker and the microphone of the Handset. The remote speaker is muted. The user can enable and disable the remote speaker with the two side buttons on the Handset. Placing a call or receiving a call is performed as detailed above, with the exception that the PTT button on the Handset is used in place of the remote PTT button.

Placing the Handset back into its cradle enables the remote speaker again, however it does not end a phone call. To end a phone call, press the End button on the radio keypad.

ADJUSTING THE VOLUME

Placing the radio into the cradle disables the radio's internal microphone and speaker and routes the audio to the remote directional microphone and remote speaker.

Use the volume control knob located on top of the radio to control the audio level of the Digital Car Kit remote speaker.

ENTERTAINMENT MUTE

If your in-vehicle entertainment system supports this capability and this feature is connected at installation and enabled by your service provider, the in-vehicle entertainment system will be muted if a call is placed or received. To activate the Entertainment Mute feature, access the radio's Car Kit Menu.

Press the 'Menu' Button then select 'Battery/Accessory' (9), 'Car Kit' (4) and 'Ent Mute' (1).

AUXILIARY ALERT

If this feature is connected at installation and enabled by your service provider, it allows the user to be alerted to an incoming private call by flashing the vehicle's headlights or sounding the horn. To activate the Auxiliary Alert, access the radio's Car Kit Menu.

Press the 'Menu' Button then select Battery/Accessory' (9), 'Car Kit' (4) and 'Aux Alert' (2).

Note: *When the Vehicle Adapter is correctly installed the Auxiliary Alert is disabled as long as the ignition switch is turned on.*

CHARGING THE RADIO BATTERY

The Digital Car Kit is designed to operate with the appropriate TETRA radio with Motorola-approved battery packs.



W A R N I N G

DO NOT fit the battery alone into the cradle as it will not be locked in place and may injure any vehicle occupants in the event of a collision.

When the radio is placed in the cradle, battery charging automatically takes place regardless of whether the vehicle ignition is ON or OFF. The charger will charge a completely discharged battery, to 90% of its full capacity, within two hours when the radio is turned off. In case of a completely flat radio battery, the Digital Car Kit will provide full operation to the radio within two minutes of being placed in the cradle, within the charging temperature limits.

Battery charging status can be determined by referring to the radio display.

To ensure maximum battery life and accurate battery capacity indication ensure, that before using a radio in the Digital Car Kit for the first time, the battery has been fully charged in an IMPRES desktop charger within the last month and that the battery is fully charged in an IMPRES desktop charger at least once every month thereafter.



C a u t i o n

The ignition switch is bypassed and the Digital Car Kit charges the radio battery from the vehicle battery. Be careful not to discharge the vehicle battery by leaving the radio inserted or allowing the radio to operate for extended periods of time with the vehicle engine turned off.

BATTERY CHARGING CONDITION

The LED on the front of the Vehicle Adapter indicates the battery charging condition as follows:

Table 1: Battery Charge Status

Flashing GREEN (for 3 sec)	Battery contact made (reading battery)
Steady RED	Battery on rapid charge (1000mA max)
Flashing RED	Battery fault or charging fault
Steady GREEN	Battery on trickle charge (90% full charge) or Battery charge complete (full charge)
Flashing YELLOW	Battery voltage too low
Steady YELLOW	Battery temperature too high (>45°C / 113°F) Battery temperature too low (< -10°C / 14°F) <i>Notes: When within the parameters stated above normal charging will begin automatically.</i> <i>Extended use of the radio at the extremes of the high and low temperature range, may cause the battery charge level to deteriorate.</i>

The charging time is approximately 2 hours for NiMH batteries and approximately 3 hours for Lilon batteries.

***Note:** Because new batteries could prematurely indicate full charge (steady green LED), charge the battery for 14 to 16 hours in an IMPRES desktop charger prior to initial use to achieve best performance.*

USING THE STANDARD DATA CABLE

***Note:** A data application program, installed on the computer is required to be able to conduct a data session.*

Connect the data cable (not supplied) from the data port on the Digital Car Kit Junction Box to the serial communication port of the computer.

CLEANING OF CONNECTORS AND CONTACTS

Clean all connector pin and battery charge contact surfaces of the Vehicle Adapter every three months, the RF contact surfaces of the antenna adapter and the bottom connector contact surfaces of the MTP700 Portable radio.

***Note:** Always use a fresh supply of alcohol and a clean container to prevent contamination by dissolved material from previous use.*

TROUBLESHOOTING

This section provides typical malfunctions that can occur during the operation of the Digital Car Kit, and suggests corrective actions.

Prior to troubleshooting the malfunction, verify the following:

1. Your radio functions properly outside the cradle.
2. All cables to the junction box are connected and fastened properly.

Identify the malfunction in accordance to Table 2 below. If the malfunction does not appear in Table 2, refer to your Service Provider.

Follow Table 2 steps after inserting the radio into the cradle .

Table 2: Troubleshooting Procedures

No.	Malfunction	Corrective Action
1	Radio inserted in cradle does not recognize car kit	<ol style="list-style-type: none">1. Verify that the radio is properly inserted into the cradle of the car kit.2. If malfunction persists, refer to your service provider .
2	Display message 'CarKitConnected' is not displayed.	<ol style="list-style-type: none">1. Remove the radio from the cradle and install it again.2. Verify that the cradle connector is properly connected to the junction box.3. If the malfunction persists, refer to your Service Provider.
3	Charging Indication (LED) is not illuminated, when a portable radio is in the cradle.	<ol style="list-style-type: none">1. Remove the handset from the cradle and install it again.2. Verify that the cradle connector is properly connected to the junction box.3. If the malfunction persists, refer to your Service Provider.4. Battery charging temperature below -30°C, increase temperature.

Table 2: Troubleshooting Procedures

No.	Malfunction	Corrective Action
4	No sound is heard from the remote speaker.	<ol style="list-style-type: none">1. Turn the radio on and set a medium volume. When the radio detects the car kit, some ring tones should be audible from the speaker.2. Verify that the remote speaker is properly connected to the junction box.3. Remove the radio from the cradle and install it again.4. If the malfunction persists, refer to your Service Provider.
5	The other party in a phone call (Radio in phone mode) does not hear your voice, or, you do not get a response after a few attempts.	<ol style="list-style-type: none">1. Verify that the radio is ON and an active call is present.2. Verify that the remote directional microphone is adjusted to your direction.3. Verify that the remote directional microphone is properly connected to the junction box.4. Remove the radio from the cradle and install it again.5. If the malfunction persists, refer to your Service Provider.
6	A dispatch call cannot be made.	<ol style="list-style-type: none">1. Verify that the remote PTT is properly connected to the junction box.2. Verify that the cradle connector is properly connected to the junction box.3. Remove the radio from the cradle and install it again.4. If the malfunction persists, refer to your Service Provider.
7	Poor communication.	<ol style="list-style-type: none">1. Remove the radio from the cradle and install it again.2. Verify that the car roof antenna is not damaged or broken.3. Verify that the RF connector on the cradle is not damaged or broken.4. Verify that the RF antenna adapter on the radio is not damaged or broken.5. If the malfunction persists, refer to your Service Provider.

Table 2: Troubleshooting Procedures

No.	Malfunction	Corrective Action
8	Charging Indication Flashing RED.	<ol style="list-style-type: none"> 1. Verify that the battery is one of the Motorola approved rechargeable NiMH or Lilon batteries PMNN 4047/4048/4049 2. Verify that the battery contacts are clean and free from foreign material - remove the radio from the Vehicle Adapter and use a pencil eraser to clean the four metal battery contacts on the bottom of the unit. 3. If the RED flashing condition persists, change the battery.
9	Radio appears dead or low battery indication.	<ol style="list-style-type: none"> 1. Radio battery discharged due to extended radio use outside the battery charging temperature limits. Charge the battery within the battery charging temperature limits.

FIELD REPAIR

The following Field Replacements Kits can be ordered separately.

Table 3: Field Replacement Kits

Kit Number	Description
GMEN4095_	Radio Contact Block
GMEN4096_	Battery Contact Block
GMEN4097_	Ball Mounting Bracket
GMEN4098_	Battery Charger Board (fully assembled pcb)
GMEN4099_	Cable and Connector (between cradle and junction box)

IMPORTANT SAFETY INSTRUCTIONS




WARNING

DO NOT fit the battery alone into the cradle as it will not be locked in place and may injure any vehicle occupants in the event of a collision.

 WARNING	<p>1. To reduce risk of injury, use the Digital Car Kit only with radios fitted with the authorized rechargeable Motorola batteries. Other batteries may explode, causing personal injury and damage.</p>
	<p>2. Do not place your Digital Car Kit and/or portable radio in the area over an air bag or in the air bag deployment area. Air bags inflate with great force. If a portable radio is placed in the air bag deployment area and the air bag inflates, the radio may be propelled with great force and cause serious injury to occupants of the vehicle.</p>
	<p>3. Do not install or remove your radio in a potentially explosive atmosphere. It is rare, but contact sparking may occur while installing or removing the radio. Sparks in such areas could cause an explosion or fire, resulting in bodily injury or even death. Note: Areas with potentially explosive atmospheres include fuelling areas, areas where the air contains chemicals or particles such as grain dust or metal powders and any area where you would normally be advised to turn off a vehicle engine. Areas with potentially explosive atmosphere are often, but not always, posted.</p>
	<p>4. Do not transport or store flammable gas, flammable liquids or explosives in the compartment of your vehicle that contains your Digital Car Kit or accessories.</p>
	<p>5. To avoid possible interference with blasting operations, turn your radio off before entering an area where you may be close to electrical blasting caps, in a "blasting area" or in areas posted "Turn off two-way radios". Obey all signs and instructions.</p>

OPERATIONAL CAUTIONS

 Caution	<p>1. Most modern electronic equipment, typically equipment in ambulances and navigation equipment are shielded from RF energy. RF energy from your radio may however interfere with some equipment. Consult your physician, or the manufacturer of any personal medical devices (such as pacemakers, hearing aids etc.) to determine if they are shielded from external RF energy.</p>
	<p>2. Turn your radio OFF in any health care facilities when any regulations posted in these areas instruct you to do so. Always request permission before using your radio or Digital Car Kit near to medical equipment.</p>

OPERATIONAL SAFETY GUIDELINES

1. This equipment is not suitable for outdoor use. Use only in dry locations. Ensure that rain or snow cannot reach the Digital Car Kit through an open vehicle window.
2. Replacement fuses fitted in the Digital Car Kit installation must comply with the type and rating specified in the equipment instructions.
3. Maximum ambient temperature around the Digital Car Kit must not exceed 60°C (140°F).
4. Prevent foreign objects or fluids from falling into the Digital Car Kit.

COMPLIANCE WITH RF ENERGY EXPOSURE STANDARDS

Your Motorola radio is designed and tested to comply with a number of national and international standards and guidelines regarding human exposure to radio frequency electromagnetic energy including:

- Institute of Electrical and Electronic Engineers (IEEE) C95.1-1999 Edition
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- United States Federal Communications Commission, Code of Federal Regulations; 47 CFR part 2 sub-part J
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95. 1-1992
- Ministry of Health (Canada) Safety Code 6. Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz, 1999
- Australian Communications Authority Radiocommunications (Electromagnetic Radiation - Human Exposure) Standard 2001
- ANATEL, Brasil Regulatory Authority, Resolution 256 (April 11, 2001) "additional requirements for SMR, cellular and PCS product certification."

OPERATIONAL INSTRUCTIONS

Transmit and Receive

- To transmit (talk), push the remote Push-To-Talk (PTT) button; to receive, release the remote PTT button.
- **Transmit only when people outside the vehicle are at least the minimum lateral distance away**, as shown in Table 3, from a properly installed, externally-mounted antenna.

Note: Table 1 lists the minimum lateral distance for bystanders in an uncontrolled environment from the transmitting types of antennas, (i.e. monopoles over a ground plane, or dipoles) at several different ranges of rated radio power for mobile radios installed in a vehicle.

Table 4: Rated Power and Lateral Distance

Rated Power of Radio (and external Antenna)	Minimum lateral distance from Transmitting Antenna
Less than 7 watts	20 cm (8 inches)
7 to 15 watts	30 cm (1 foot)

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